**Pharmacology**

**Please provide 3 differential diagnoses, as well as an indication of your primary diagnosis.**

1) Pyelonephritis (primary): is a medical condition affecting the upper urinary tract and mainly characterized by an inflamed renal pelvis and renal parenchyma. This inflammation may either occur in one or both the two kidneys. The main clinical indications of pyelonephritis are fever, nausea, chills, vomiting, costovertebral angle tenderness and flask pain (Kawamoto, Macura, & Zagoria, 2016).

2) Cystitis: is a medical condition the urinary bladder is inflamed, mainly caused by bacterial infections (Brown, & Cadogan, 2015).

3) Prostatitis: is a medical condition where the prostate gland becomes tender, swollen and inflamed. It is mainly characterized by high fever, pain, chills, muscle aches and painful urination (Brown, & Cadogan, 2015).

**What additional tests would you order to confirm a diagnosis?**

For the diagnosis of Pyelonephritis, I would recommend urinalysis and urine culture. Since pyuria is a presenting condition of pyelonephritis, it is also necessary to carry out the nitrite acid test or the leukocyte esterase test.

Other tests may include, ultrasound, computerized tomography scan, digital rectal examination, voiding cystourethrogram and dimercaptosuccinic acid scintigraphy (Kawamoto, Macura, & Zagoria, 2016).

Once this has been completed, please indicate and describe your chosen pharmacological treatment with inclusion of dose and mechanism of action of your chosen prescription.

The best choice of drug for the above complication is trimethoprim- sulfamethoxazole. The patient should take one double strength tablet- 800 mg orally, twice daily for 10 days. This will help improve the mental condition of the patient and reduction of the Urinary Tract Infection symptoms, which will seize upon completion of the dose (Uno et al., 2017).

Mechanism of action: trimethoprim- sulfamethoxazole is a combination of two antibiotics with synergistic effects against a variety of bacterial infections. The action of Sulfamethoxazole is through inhibiting of the synthesis of dihydrofolic acid by opposing the actions of para-aminobenzoic acid (PABA). This is an intermediary step in the synthesis of tetrahydrofolic acid. This reaction is catalyzed by dihydropteroate synthetase (Uno et al., 2017). Sulfamethoxazole binds to this catalytic enzyme. On the other hand Trimethoprim binds to dihydrofolate reductase of the bacteria leading to the formation of tetrahydrofolic acid.

**References**

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